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ABSTRACT

Within the past several years of education reform, portfolios and other types of performance-based assessment have come to be recognized as viable alternatives to standardized tests. This report discusses insights gained through the use of portfolios at the university level with preservice students and their field-based experiences. Although portfolios can be used in other disciplines, the examples in this paper highlight uses in mathematics, and point out benefits in areas such as problem-solving, and helping students to become reflective. (ZWH)

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ACCOMMODATING ASSESSMENT AND LEARNING:

Utilizing Portfolios in Teacher Education with Preservice Teachers

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Accommodating Assessment and Learning:
Utilizing Portfolios in Teacher Education with Preservice Teachers

One of the most difficult aspects of education reform involves revising the ways we think about and use assessment. This seems to be true whether we are considering educational reform at the national, state, or local level. Our purpose in this paper is to examine the types and uses of portfolios in performance assessment for mathematics and problem-solving. We will also attempt to offer specific suggestions to educators interested in using portfolios to help students become reflective about themselves and their students. We begin by briefly identifying the boundaries of our discussion and defining our terms. Then, we examine how portfolios can be used in performance assessment.

Performance Assessment

Good teachers have historically used performance assessment to monitor the progress of their students in many disciplines. Clearly, assessment is of crucial importance to all academic disciplines and areas of learning in this era of reform. We are limiting our discussion to reflective assessment because we want to examine the use of portfolios at the university level with preservice students and their field-based experiences. Hopefully, lessons learned from dealing with assessment in this manner will prove useful to those educators interested in improving assessment in other areas.

The emphasis on performance assessment, the use of portfolios, comes from a widespread dissatisfaction with more traditional methods of assessment which include standardized achievement test, criterion-referenced tests, unit tests in commercial reading and mathematics series, diagnostic test, and even

teacher-designed, objective, multiple-choice test (e.g. Haney & Madaus, 1989; Johnson, 1984; Miller-Jones, 1989; Nickerson, 1989; Resnick & Resnick, 1990; Shepard, 1989; Suhor, 1985). Different writers focus on different limitations, but here are three common reasons why many educators are dissatisfied with traditional assessments.

First, many traditional assessments have been based upon an outdated and **inappropriate model of literacy**. The research of process versus product in the past two decades has changed the way we view assessment. Traditional assessments are often removed from real purposes and uses, test esoteric skills in isolation and ignore the prior knowledge and thinking strategies.

Second, the student's objective for these assessments is reduced to gaining high scores on traditional tests, the goal(s) thus become defined in terms of **competitive success on test** rather than on authentic learning. Students compete against one another with the loser(s) experiencing increasing anxiety, low self-esteem, cynicism about teachers and school, and devaluation of education (Jones & Winborne, 1992).

Third, traditional assessments often provide **results that are rarely understood** by students; are of limited use to teachers; and are subject to misuse and misinterpretation by policy maker (e.g. Neill & Medina, 1989; Winograd, Paris, Bridge, 1991). The scores from traditional assessments are presented often in the newspaper) as if they were accurate and valid measures of teaching or learning. In reality, they are neither; instead, traditional tests measure students' accumulated knowledge, test-taking skills, and socioeconomic status (e.g., Guskey & Keifer, 1989). In addition, the validity of the measures can vary widely for individuals and may reflect confounded effects related to home experiences or test conditions.

Like many other educators, we believe that portfolios and other kinds of performance assessment can be helpful in overcoming many of the limitations of more traditional approaches to assessment. One important factor in using portfolios successfully, however, is a clear understanding of what is entailed in this approach.

Portfolio Assessment

Within the past several years of education reform, portfolios and other types of performance-based assessment have come to be recognized as viable alternatives to standardized tests (e.g., Tierney, Carter, Desai, 1991; Wiggins, 1989). However, the use of performance-based assessment – particularly portfolios – is not new. Artists, writers, models, and photographers have always utilized portfolios to demonstrate their professional and performance abilities. In this same sense, portfolios can be purposeful collections of a preservice students' work that exhibit his or her efforts, achievements, progress and performance in one or more areas. As a reflective assessment instrument, it is a tool to expand the quantity and quality of information we used to examine student learning and growth.

Performance assessments may represent tasks that are faced by people in the real world. Such assessment often involve seeing if students can apply the things of value they have been learning. "Successful" students should be able to use basic communication and mathematics skills; apply core concepts and principles from content areas; become a self-sufficient individual; the ability to become responsible members of a family, work group, or community; to think and solve problems; to connect and integrate experiences and new knowledge from all subject matter fields into their own existing knowledge base (Council on School Performance Standards Committee, 1989).

An example of a performance task in mathematics at the elementary level would be to have the students plan a party for ten students which would cost under twenty-five dollars. The elementary students would need to plan the costs of food, soda pop, prizes, invitations, postage, etc. The students would be assessed on their success to solve this real-life situation by applying appropriate computational methods (e.g. estimation) and proposing a solution, after gathering information and exploring possible strategies.

The example is one type of performance-based assessment. Portfolios are another type of performance-based assessment. Although many forms of performance-based assessment require students to complete an authentic task in a relatively short period of time, in contrast, portfolios are collections of authentic tasks gathered across time and across contexts.

As a type of performance-based assessment, portfolio tasks are representative of the ways that people use problem-solving in the real world. Thus, in considering the question of how to use portfolios in performance assessment, it is helpful to think of performance assessment as a class of assessment types and portfolios as one member of that class with its own special strengths and limitations. It is also important to note that, the use of portfolios does not necessarily preclude the use of other kinds of assessments including other types of performance assessments.

Types of Portfolios and Their Uses

The use of portfolios in classroom emphasizes several important messages about instruction and assessment. First, it is important to **collect evaluative information formatively as well as summatively**. Second, it communicates to students, teachers, parents, administrators and policy makers that **assessment is something we all value**. Third, it **promotes self-evaluation or reflection** for goal-

setting. As a result, there are different kinds of portfolios which can attributed to different purposes and uses of assessment.

One of the most popular types of portfolios is a **best pieces** portfolio which contains examples of work that the student (sometimes with help from the teacher) consider to be his or her best efforts. Best pieces portfolios actively involve the student in self-evaluation (Paulson, Paulson, & Meyer, 1991). Tierney, Carter, and Desai (1991) also stress that portfolios are not objects, but rather represent the student's abilities to engage in the processes of selecting, comparing, self-evaluating, sharing, and goal setting.

Another kind of portfolio that is in use around the country is a **descriptive portfolio** that enables instructors to gather a wide variety of measures on the students they teach. For example, teacher in the South Brunswick Public Schools in New Jersey use a descriptive portfolio to help them better document progress for the children in the kindergarten-second grade program. These portfolios include self portraits drawn by the child; interviews with the child and with the parents; and the results from the concepts tests, writing activities, and writing samples.

Many teacher are familiar with **process portfolios** that are an intrinsic part of the writing process advocated by people such as Graves (1983), Hansen (1987), and others. Process portfolios can contain a variety of products including finished projects, manuscripts in progress, plans for topics of future papers/activities, and lists identifying ways in which the student has grown as a problem-solver. These are similar to the **working portfolios** in mathematics discussed by Zollman (1993b).

Finally, a number of states are requiring teachers to gather **accountability portfolios**. The 1990 Kentucky Education Reform Act, for example, requires

teachers and students at the fourth, eighth, and twelfth grades to collect mathematics and writing portfolios on all students. This portfolio will provide part of the basis for the state to determine the quality of instruction.

An example of a portfolio entry task in mathematics that could be included in an accountability, process, or best pieces portfolio, would be one that has early elementary students bring in one can of their favorite soup (or draw a picture of the can). The mathematics concept is taking a authentic real-world situation and mathematically representing it in graph form. Before beginning the activity, the elementary students would be asked to predict their ideas. Students would then classify and organize the "data" of cans. Next they would be expected to pictorially represent these data on appropriately-sized graph paper in cooperative groups. The portfolio aspect of this activity would be for the students to describe and to justify their procedures for obtaining and representing their results, as well as to reflect upon their predictions in light of their results.

Best pieces portfolios, descriptive portfolios, process portfolios, or accountability portfolios are not the only kinds of portfolios in use. Nor are they pure types that are clearly distinct from each other. More importantly, teachers and students often find that the portfolios they use in class may serve different functions at different times. In actual use, it is often hard to categorize portfolios as purely a best pieces, descriptive, or process portfolios.

Now that we have defined portfolio assessment and described some types of portfolios, let us focus on what can be gained through their use. Recall our discussion of some of the limitations of traditional approaches to assessment. With the use of portfolios, many of these limitations can be avoided, at the same time gaining several benefits. First, using portfolios, students can be facilitated to **work cooperatively, communicate clearly, and apply learning strategies to**

authentic, real-world situations. Second, portfolios offer the possibility of **involving students in their own learning, e.g., active learning**. The research literature on metacognition and strategic learning (e.g., Palinscar & Brown, 1986; Paris, Lipson & Wixson, 1983; Paris & Winograd, 1990) stresses the importance of self-regulation in learning and portfolios – in particular, those that encourage students to reflect – appears to be an effective way of increasing opportunities for students to take ownership of their learning.

A third benefit of portfolios, is that it empowers the **learner with the self-confidence** to become an independent thinker (Zollman,1993b). Fourth, portfolios are diagnostic, **the kinds of information obtained from portfolios seems to provide more insight into how students can actually perform** on meaningful tasks. Fifth, it values and documents the student's **progress over time and across tasks**. Lastly, portfolios **merge the instructional and assessment activities** of teaching (Zollman, 1993a).

So far we have focused on the use of portfolios in performance assessment. We have defined portfolio assessment, discussed the problems that exists with traditional approaches to assessment and examined why portfolio are receiving so much attention. In the next section of this article we will examine the use of portfolios in more detail.

Using Portfolios to Improve Instruction and Assessment

In this section, we will provide examples of how portfolio assessment can be used to improve instruction and assessment. We feel that portfolios are **most** effective when they are used to learn more about individual students. We further feel that portfolios are **least** effective when they are used to gain some sense of group performance (a student throughout a school, a cohort, or a state). We **do** advocate the use of portfolios as part of a statewide assessment for the purposes of

accountability as such portfolios are a major improvement over traditional standardized multiple-choice tests. But it is our belief that portfolio assessment is **most** powerful and **most** appropriate when it is used by individual students, teachers and parents (Winograd & Jones, 1992).

One of the most important themes emerging from current research on assessment is that preservice teachers must be involved in evaluating their growth as learners. We are beginning to understand that the most powerful forms of evaluation are those judgments that learners make about themselves in non-threatening contexts. Portfolio assessment, especially those that provide students with systematic opportunities for self-reflection, are an excellent means of evaluation for helping students gain ownership of their own learning.

When used to compile assessment and diagnostic information for public school students while participating in field experiences, portfolios could include: (1) the university student's philosophy of mathematics education (including ideas from the NCTM *Standards*); (2) sections on mathematics topics of class presentations & instructional aids; (3) samples of performance evaluations; sample tests, quizzes, and lesson plans; (4) sample of students' work w/range of: across subjects, students, and time; (5) samples of thematic units; (6) education article critiques (e.g., *The Arithmetic Teacher)*; (7) educational software critique; (8) reflective writing assignments; and (9) class assignments.

The results from interviews can also play á powerful role in helping students become more self-reflective. Since portfolios can provide an effective means for helping students become more self-reflective and involved in their own learning, this is one of the reasons why portfolios are such an improvement over traditional approaches to assessment in teacher education programs. To be exact, portfolios (and other types of performance-based assessments) measure more

meaningful outcomes of learning and thus, preservice teacher can improve their instruction accordingly.

Summary

Portfolios and other types of performance-based assessments may go a long way in helping us revise the ways we think about and use assessment. In addition, portfolios do seem to address many of the limitations of more traditional methods of assessment. Portfolios are one way to assess many of the more complex dimensions of literacy and they are more flexible in meeting the disparate needs of students and teachers.

If portfolios are to fulfill their potential, however, there are a number of concerns that must be addressed. Educators need support in learning how to design, manage, and interpret portfolios. Moreover, we must never lose sight of the fact that improving assessment is only part of what is entailed in education reform. Preservice teachers still need support in developing instruction which addresses the full range of students found in today's classrooms. Unless adequate time and money is invested in supporting these teachers development efforts as professionals, then new forms of assessment will do little to change classrooms. In summary, portfolios and other types of performance-based assessments can be powerful tools in our effort to reform education. But like other tools, their effectiveness depends on the skill, energy, enthusiasm, and creativity of those who apply them.

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